

### Remarks

In view of the above amendments and the following remarks, reconsideration of the outstanding office action is respectfully requested.

According to an April 2001 report by the United States Department of Agriculture, National Agricultural Statistics Service, Sp Cr 6-1 (01), entitled "Floriculture Crops: 2000 Summary", during the previous year the wholesale value of domestically produced cut flowers was \$427 million. The top three valued cut flower categories were Roses at \$69.4 million, Lilies at \$58.6 million, and Gladioli at \$32.2 million. While the U.S. cut flower industry is not insignificant, two-thirds of the cut flowers sold in the U.S. in 1998 were imported, and this import market was worth \$1 billion. Of the imports coming into the U.S. that year, 56% were from Colombia, 22% from elsewhere in Central & South America, and about 18% from The Netherlands.

Postharvest handling methods that were developed over 20 years ago on U.S. produced flowers are still current practice in the fresh flower industry. However, as noted above, many flowers sold in the U.S. today are imported from Colombia and Ecuador and can be 8-10 days old when purchased by consumers. Current problems with cut flower longevity and quality are associated with shifts in the geographical locations of production, introduction of new varieties, long-distance transport from farm to consumer, improper transport and storage temperatures, and undesirable handling practices. With respect to transport and storage temperatures, prevalent problems include: flowers are often not pre-cooled adequately when they leave the grower; use of non-refrigerated trucks during shipment; boxed flowers which sit for extended periods on non-refrigerated docks; and flowers are not kept cool during air transport.

The effect that these problems can have on cut flower longevity includes not only poor appearance of flowers at retail sites, but also loss of flowers (i.e., wilting or dying) prior to the time they reach the retailer or shortly thereafter. In either case, the wholesaler or the retailer may realize financial losses as a result.

A number of strategies have been devised to minimize flower loss. These include treatment with silver thiosulfate, 1-methylcyclopropene (MCP), carboxymethoxylamine (also known as aminoxyacetic acid (AOAA)), AVG, N-AVG, rhizobitoxine, or L-trans-2-amino-4-methoxy-3-butenoic acid (MVG). Silver thiosulfate and MCP are believed to inhibit the effect of either internal or external ethylene, while the others are believed to act internally to inhibit the ability of the cut flowers, plants, and fruit to produce ethylene. These compounds (except MCP) are typically applied to plants or plant

materials in the form of an aqueous treatment solution. Applications of the treatment solution to potted plants are carried out by spraying it onto the aerial parts of the plants or by including it in the irrigation water which is supplied to their roots. Treatment of cut flowers or greens is typically carried out by immersing the cut ends of the stems in the aqueous solution containing the treating agent immediately after harvest, during transportation or while the floral arrangement is on display, although they might be treated by immersing the whole flowers into a solution or by spraying them. Since MCP is a gas, it cannot readily be applied in aqueous solution, so plants are treated by exposing them to a modified, controlled atmosphere (containing a defined amount of MCP) in an enclosed chamber.

Silver thiosulfate is expensive and it may be toxic to animals. Although MCP is now commercially available, its use is limited due to difficulties in application and its lack of stability.

However effective these earlier attempts to reduce cut flower losses, there still exists a need to provide improved, non-toxic and easily practiced approaches for minimizing the losses of ornamental plant cuttings. The present invention is directed to overcoming these deficiencies in the art.

The provisional rejection of claims 1-7 and 75-79 as being unpatentable under the judicially created doctrine of obviousness-type double patenting over claims 1, 2, 5, 8, 11, 13, 15, 17, and 19 of U.S. Patent No. 5,776,889 to Wei et al. ("Wei I") is respectfully traversed.

Wei I teaches the application of a hypersensitive response elicitor protein or polypeptide to plants whereby the treated plant is rendered disease resistant (i.e., resistant to pathogens). Wei I provides a number of examples for the treatment of different plants with HrpN of *Erwinia amylovora*, with the treated plants being grown under greenhouse conditions. Nowhere does Wei I teach or suggest the removal or harvesting of cuttings from the treated plants.

Claim 1 of Wei I recites a method of imparting pathogen resistance to plants that includes the step of "applying externally to a plant a hypersensitive response eliciting bacterium, which does not cause disease in that plant, or a hypersensitive response eliciting polypeptide or protein, wherein the hypersensitive response eliciting polypeptide or protein corresponds to that derived from a pathogen selected from the group consisting of *Erwinia amylovora*, *Erwinia chrysanthemi*, *Pseudomonas syringae*, *Pseudomonas solanacearum*, *Xanthomonas campestris*, and mixtures thereof." None of claims 2, 5, 8, 11, 13, 15, 17, and

19 of Wei I specify that the recited plant (treated with the hypersensitive response eliciting bacterium or the hypersensitive response eliciting polypeptide or protein) has cuttings that are removed or harvested therefrom.

The U.S. Patent and Trademark Office (“PTO”) has taken the position that the presently claimed invention is not patentably distinct over the above-listed claims of Wei I. Applicants respectfully disagree. Neither claim 1 of Wei I nor any of claims 2, 5, 8, 11, 13, 15, 17, and 19 of Wei I specify “removing a cutting from the treated plant...” as recited in claim 1 or “harvesting from the treated plant a cutting that contains at least one flower...” as recited in claim 75. Likewise none of the Wei I claims specify “exposing the removed cutting to conditions that...would cause desiccation of the removed cutting” as recited in claim 1 or “exposing the harvested cutting to conditions that...would cause desiccation of the cutting or the at least one flower thereon” as recited in claim 75. Because the invention claimed in Wei I fails to teach or suggest the above-identified steps of claims 1 and 75, the obviousness-type double patenting rejection of claims 1-7 and 75-79 is improper and should be withdrawn.

The provisional rejection of claims 1-17, 25-41, and 80-85 as being unpatentable under the judicially created doctrine of obviousness-type double patenting over claims 1-20 of copending application U.S. Patent Application Serial No. 09/835,684 to Wei et al. (“Wei II”) is rendered moot with respect to canceled claims 13-17 and is respectfully traversed with respect to claims 1-12, 25-41, and 80-85.

Wei II relates to the inhibition of postharvest disease and the inhibition of desiccation of fruits or vegetables from plants. This is achieved either by harvesting the fruits or vegetables from plants treated with a hypersensitive response elicitor protein or polypeptide, treating harvested fruits or vegetables with a hypersensitive response elicitor protein or polypeptide, or both.

Claim 1 of Wei II recites a method of inhibiting postharvest disease or desiccation in a fruit or vegetable that includes the step of “treating a fruit or vegetable with a hypersensitive response elicitor protein or polypeptide under conditions effective to inhibit postharvest disease or desiccation.” None of claims 2-20 specify that the recited method includes the steps of removing or harvesting a cutting from a plant or a treated plant.

The PTO has taken the position that the presently claimed invention is not patentably distinct over the above-listed claims of Wei II. Applicants respectfully disagree. Neither claim 1 of Wei II nor any of claims 2-20 of Wei II specify “removing a cutting from

the treated plant..." as recited in claim 1, a "cutting which has been removed from a plant treated with a hypersensitive response elicitor protein or polypeptide..." as recited in claim 8, "harvesting a cutting from a plant..." as recited in claim 25, "removing a cutting from a plant..." as recited in claim 31, a "cutting which has been removed from a plant, wherein the cutting has been treated with a hypersensitive response elicitor protein or polypeptide..." as recited in claim 37, or "harvesting from a plant a cutting that contains at least one flower..." as recited in claim 81. Page 35, line 20 of the present application specifies that suitable cuttings include "stems, leaves, flowers, or combinations thereof." Thus, a cutting is not a fruit or vegetable. Likewise, none of the Wei II claims specify "exposing the removed cutting to conditions that...would cause desiccation of the removed cutting" as recited in claims 1 and 31, or "exposing the harvested cutting to conditions that...would cause desiccation of the cutting or the at least one flower thereon" as recited in claim 81. Because the invention claimed in Wei II fails to teach or suggest the above-identified limitations of claims 1, 8, 25, 31, 37, 75, and 81, the obviousness-type double patenting rejection of claims 1-12, 25-41, and 80-85 is improper and should be withdrawn.

The rejection of claims 1-7 and 75-79 under 35 U.S.C. § 102(e) as being anticipated by Wei I is respectfully traversed.

The teachings of Wei I are set forth above.

The PTO has taken the position that the plants of Wei I, topically treated with the hypersensitive response elicitor protein HrpN, are inherently desiccation resistant. To establish that a reference inherently anticipates a claim, it must be demonstrated that the reference necessarily functions in accordance with the limitations of a claim. See In re Cruciferous Sprout Litigation v. Sunrise Farms, 301 F.3d 1343, 1349 (Fed. Cir. 2002). Claim 1 presently recites "treating a plant with a hypersensitive response elicitor protein or polypeptide...removing a cutting from the treated plant...and exposing the removed cutting to conditions that ... would cause desiccation of the removed cutting, whereby said treating inhibits desiccation of the removed cutting" and claim 75 presently recites "treating a plant with a hypersensitive response elicitor protein or polypeptide...harvesting from the treated plant a cutting that contains at least one flower...and exposing the harvested cutting to conditions that, in the absence of said treating, would cause desiccation of the cutting or the at least one flower thereon, whereby the cutting exhibits enhanced longevity of flower blooms...." Thus, both claim 1 and claim 75 require more than merely treating a plant with a hypersensitive response elicitor protein or polypeptide. Because Wei I fails to teach or

suggest “removing a cutting from the treated plant...and exposing the removed cutting to conditions that...would cause desiccation of the removed cutting” as in claim 1 and “harvesting from the treated plant a cutting that contains at least one flower...and exposing the harvested cutting to conditions that...would cause desiccation of the cutting or the at least one flower thereon” as in claim 75, Wei I cannot anticipate the presently claimed invention. Because the imparting of disease resistance as in Wei I does not require one of ordinary skill in the art to remove or harvest a cutting from the disease resistant plant let alone expose such a cutting to the recited conditions, the above-noted method steps cannot *necessarily* be taught in Wei I. And even assuming *arguendo* that the plant of Wei I is inherently rendered resistant to desiccation, which applicants do not admit, Wei I provides no basis for concluding that a cutting removed from such a plant would maintain its desiccation resistance. Wei I likewise provides no basis for concluding that the longevity of flower blooms would be enhanced on cuttings removed from such plants. Hence, it is impossible to conclude that the presently claimed methods of inhibiting desiccation of cuttings removed from plants (as in claim 1) and enhancing the longevity of flower blooms (as in claim 75) are inherently taught by Wei I.

For this reason, the rejection of claims 1-7 and 75-79 as anticipated by Wei I is improper and should be withdrawn.

The rejection of claims 13-17 under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,277,814 to Qiu et al. is rendered moot by the cancellation of those claims.

The rejection of claims 1-7 and 13-17 under 35 U.S.C. § 102(e) as anticipated by WO 00/20452 to Wei et al. (“Wei III”) is rendered moot with respect to canceled claims 13-17 and is respectfully traversed with respect to claims 1-7.

Because Wei III is not an international application under 35 U.S.C. § 371 that designates the United States, Wei III is not available as prior art under 35 U.S.C. § 102(e). Therefore, this rejection is improper and should be withdrawn.

However, applicants would like to bring to the attention of the PTO co-pending U.S. Patent Application Serial No. 09/412,100 to Wei et al. (“Wei IV”) filed October 5, 1999. Wei IV is substantially identical to Wei III and teaches the preparation of fragments of hypersensitive response elicitor proteins, which fragments do *not* elicit a hypersensitive response when introduced onto plant tissues but do impart pathogen resistance, enhance plant growth and/or control insects on the plants.

The PTO has taken the position that the plants of Wei III (and thus Wei IV), topically treated with the non-hypersensitive response eliciting fragments of HrpN or HrpZ,

are inherently desiccation resistant. As noted above, to establish that a reference inherently anticipates a claim, it must be demonstrated that the reference necessarily functions in accordance with the limitations of a claim. Claim 1 presently recites “treating a plant with a hypersensitive response elicitor protein or polypeptide...removing a cutting from the treated plant...and exposing the removed cutting to conditions that ... would cause desiccation of the removed cutting, whereby said treating inhibits desiccation of the removed cutting.” Thus, claim 1 requires more than merely treating a plant with a hypersensitive response elicitor protein or polypeptide. Because Wei III fails to teach or suggest “removing a cutting from the treated plant...and exposing the removed cutting to conditions that ... would cause desiccation of the removed cutting” as in claim 1, Wei III cannot anticipate the presently claimed invention. Because the imparting of disease resistance as in Wei III does not require one of ordinary skill in the art to remove or harvest a cutting from the disease resistant plant let alone expose such a cutting to the recited conditions, the above-noted method steps cannot *necessarily* be taught in Wei III. And even assuming *arguendo* that the plant of Wei III is inherently rendered resistant to desiccation, which applicants do not admit, Wei III provides no basis for concluding that a cutting removed from such a plant would maintain its desiccation resistance. Hence, it is impossible to conclude that the presently claimed method of inhibiting desiccation of cuttings removed from plants (as in claim 1) is inherently taught by Wei III.

For these reasons, the rejection of claims 1-7 as anticipated by Wei III is improper and should be withdrawn.

The rejection of claims 1-7 and 13-17 under 35 U.S.C. § 102(e) as anticipated by WO 00/28055 to Wei et al. (“Wei V”) is rendered moot with respect to canceled claims 13-17 and is respectfully traversed with respect to claims 1-7.

Because Wei V is not an international application under 35 U.S.C. § 371 that designates the United States, Wei V is not available as prior art under 35 U.S.C. § 102(e). Therefore, this rejection is improper and should be withdrawn.

However, applicants would like to bring to the attention of the PTO co-pending U.S. Patent Application Serial No. 09/431,614 to Wei et al. (“Wei VI”) filed November 4, 1999. Wei VI is substantially identical to Wei V and teaches the application of a hypersensitive response elicitor protein or polypeptide to plants whereby the treated plant is rendered stress resistant. Nowhere does Wei VI teach or suggest the removal or harvesting of cuttings from the treated plants.

The PTO has taken the position that the plants of Wei V (and thus Wei VI), topically treated with the hypersensitive response elicitor protein HrpN are inherently desiccation resistant. As noted above, to establish that a reference inherently anticipates a claim, it must be demonstrated that the reference necessarily functions in accordance with the limitations of a claim. Claim 1 presently recites “treating a plant with a hypersensitive response elicitor protein or polypeptide...removing a cutting from the treated plant...and exposing the removed cutting to conditions that ... would cause desiccation of the removed cutting, whereby said treating inhibits desiccation of the removed cutting.” Thus, claim 1 requires more than merely treating a plant with a hypersensitive response elicitor protein or polypeptide. Because Wei V fails to teach or suggest “removing a cutting from the treated plant...and exposing the removed cutting to conditions that ... would cause desiccation of the removed cutting” as in claim 1, Wei V cannot anticipate the presently claimed invention. Because the imparting of stress resistance as in Wei V does not require one of ordinary skill in the art to remove or harvest a cutting from the stress-resistant plant let alone expose such a cutting to the recited conditions, the above-noted method steps cannot *necessarily* be taught in Wei V. And even assuming *arguendo* that the plant of Wei V is inherently rendered resistant to desiccation, which applicants do not admit, Wei V provides no basis for concluding that a cutting removed from such a plant would maintain its desiccation resistance. Hence, it is impossible to conclude that the presently claimed method of inhibiting desiccation of cuttings removed from plants (as in claim 1) is inherently taught by Wei V.

For these reasons, the rejection of claims 1-7 as anticipated by Wei V is improper and should be withdrawn.

The rejection of claims 1-7 and 13-17 under 35 U.S.C. § 102(e) as anticipated by WO 99/11133 to Beer et al. (“Beer”) is rendered moot with respect to canceled claims 13-17 and is respectfully traversed with respect to claims 1-7.

Because Beer is not an international application under 35 U.S.C. § 371 that designates the United States, Beer is not available as prior art under 35 U.S.C. § 102(e). Therefore, this rejection is improper and should be withdrawn.

Although Beer is available as prior art under 35 U.S.C. § 102(b), Beer fails to anticipate the presently claimed invention. Beer teaches applying the hypersensitive response elicitor of *Clavibacter michiganensis* to plants and thereby imparting disease resistance, enhancing plant growth, and/or controlling insects.

The PTO has taken the position that the plants of Beer, topically treated with the *Clavibacter michiganensis* hypersensitive response elicitor protein, are inherently desiccation resistant. As noted above, to establish that a reference inherently anticipates a claim, it must be demonstrated that the reference necessarily functions in accordance with the limitations of a claim. Claim 1 presently recites “treating a plant with a hypersensitive response elicitor protein or polypeptide...removing a cutting from the treated plant...and exposing the removed cutting to conditions that ... would cause desiccation of the removed cutting, whereby said treating inhibits desiccation of the removed cutting.” Thus, claim 1 requires more than merely treating a plant with a hypersensitive response elicitor protein or polypeptide. Because Beer fails to teach or suggest “removing a cutting from the treated plant...and exposing the removed cutting to conditions that ... would cause desiccation of the removed cutting” as in claim 1, Beer cannot anticipate the presently claimed invention. Because the imparting of disease resistance, growth enhancement, and/or insect control as in Beer does not require one of ordinary skill in the art to remove or harvest a cutting from the treated plant let alone expose such a cutting to the recited conditions, the above-noted method steps cannot *necessarily* be taught in Beer. And even assuming *arguendo* that the plant of Beer is inherently rendered resistant to desiccation, which applicants do not admit, Beer provides no basis for concluding that a cutting removed from such a plant would maintain its desiccation resistance. Hence, it is impossible to conclude that the presently claimed method of inhibiting desiccation of cuttings removed from plants (as in claim 1) is inherently taught by Beer.

For these reasons, the rejection of claims 1-7 and 13-17 as anticipated by Beer is improper and should be withdrawn.

The rejection of claims 1-7 and 13-17 under 35 U.S.C. § 102(e) as anticipated by WO 00/20616 to Wei et al. (“Wei VII”) is rendered moot with respect to canceled claims 13-17 and is respectfully traversed with respect to claims 1-7.

Because Wei VII is not an international application under 35 U.S.C. § 371 that designates the United States, Wei VII is not available as prior art under 35 U.S.C. § 102(e). Therefore, this rejection is improper and should be withdrawn.

However, applicants would like to bring to the attention of the PTO co-pending U.S. Patent Application Serial No. 09/829,124, filed April 9, 2001 to Wei et al.

(“Wei VIII”). Wei VIII was filed after the present application and, therefore, is not available as prior art.

The provisional rejection of claims 1-17, 26-41, and 80-85 under 35 U.S.C. § 103(a) for obviousness over Wei II is rendered moot with respect to claims 13-17 and is respectfully traversed with respect to claims 1-12, 26-41, and 80-85.

Applicants, through the undersigned attorney, hereby assert that both Wei II (filed April 16, 2001) and the present application (filed November 5, 2001) were, at the time the invention was made, owned by EDEN Bioscience Corp. or subject to an obligation of assignment. An assignment of the present application to EDEN Bioscience Corp. has been recorded at reel/frame 012768/0497. An assignment of Wei II to EDEN Bioscience Corp. has been recorded at reel/frame 012069/0318.

In view of the foregoing, applicants submit that the rejection of claims 1-12, 26-41, and 80-85 under 35 U.S.C. § 103(a) for obviousness over Wei II is improper and should be withdrawn.

The rejection of claims 8-12 under 35 U.S.C. § 103(a) for obviousness over Wei I in view of Laurie et al, Commercial Flower Forcing: The Fundamentals and Their Practical Application to the Culture of Greenhouse Crops, pp. 258-259 (1969) (“Laurie”).

The teachings of Wei I are set forth above.

Laurie is cited merely for the production of cut flowers from various plants.

The PTO has taken the position that it would have been obvious to obtain cut flowers from a plant treated in accordance with Wei I, which the PTO asserts would have inherently been desiccation resistant. In particular, the PTO asserts that there would have been a reasonable expectation of success “given the *knowledge* that this method works on a complete plant as taught by Wei et al. (emphasis added).”

Applicants submit that the PTO has failed to make a *prima facie* case of obviousness, because the PTO’s use of a feature asserted to be inherent in support of an obviousness determination is improper. In particular, the PTO has failed to demonstrate that one of ordinary skill in the art would have *known* that the plants treated by Wei I were desiccation resistant. The feature asserted to be inherent is immaterial, for purposes of obviousness, if one of ordinary skill in the art would not have appreciated or recognized the inherent result. See In re Naylor 369 F.2d 765, 768, 152 USPQ 106, 108 (CCPA 1966). In this instance, because Wei I teaches the growth of treated plants under greenhouse conditions, one of ordinary skill in the art would have had no way of assessing whether the treated plants

in Wei I were actually desiccation resistant. Hence, the status of those plants as desiccation resistant, even if inherent (which applicants do not admit), was unknown. It is well established law that obviousness cannot be predicated on what is unknown. In re Shetty, 566 F.2d 81, 86, 195 USPQ 753, 757 (CCPA 1977). Thus, given that Wei I is silent with respect to the desiccation resistance of the plants treated therein and for the reasons noted above one of ordinary skill in the art would have had no reason to know that the plants of Wei I were in fact desiccation resistant, the presently claimed cutting would not have been obvious to one of ordinary skill in the art. As a result, the rejection of claims 8-12 for obviousness over Wei I in view of Laurie is improper and should be withdrawn.

The rejection of claims 1-40 and 75-85 under 35 U.S.C. § 112 (second paragraph) for indefiniteness is respectfully traversed in view of the above amendments.

In view of the all of the foregoing, applicants submit that this case is in condition for allowance and such allowance is earnestly solicited.

Respectfully submitted,

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Date	10/8/03	Jane C. Wirszyk
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